Navigation 3

Skipper/XO Training

2005

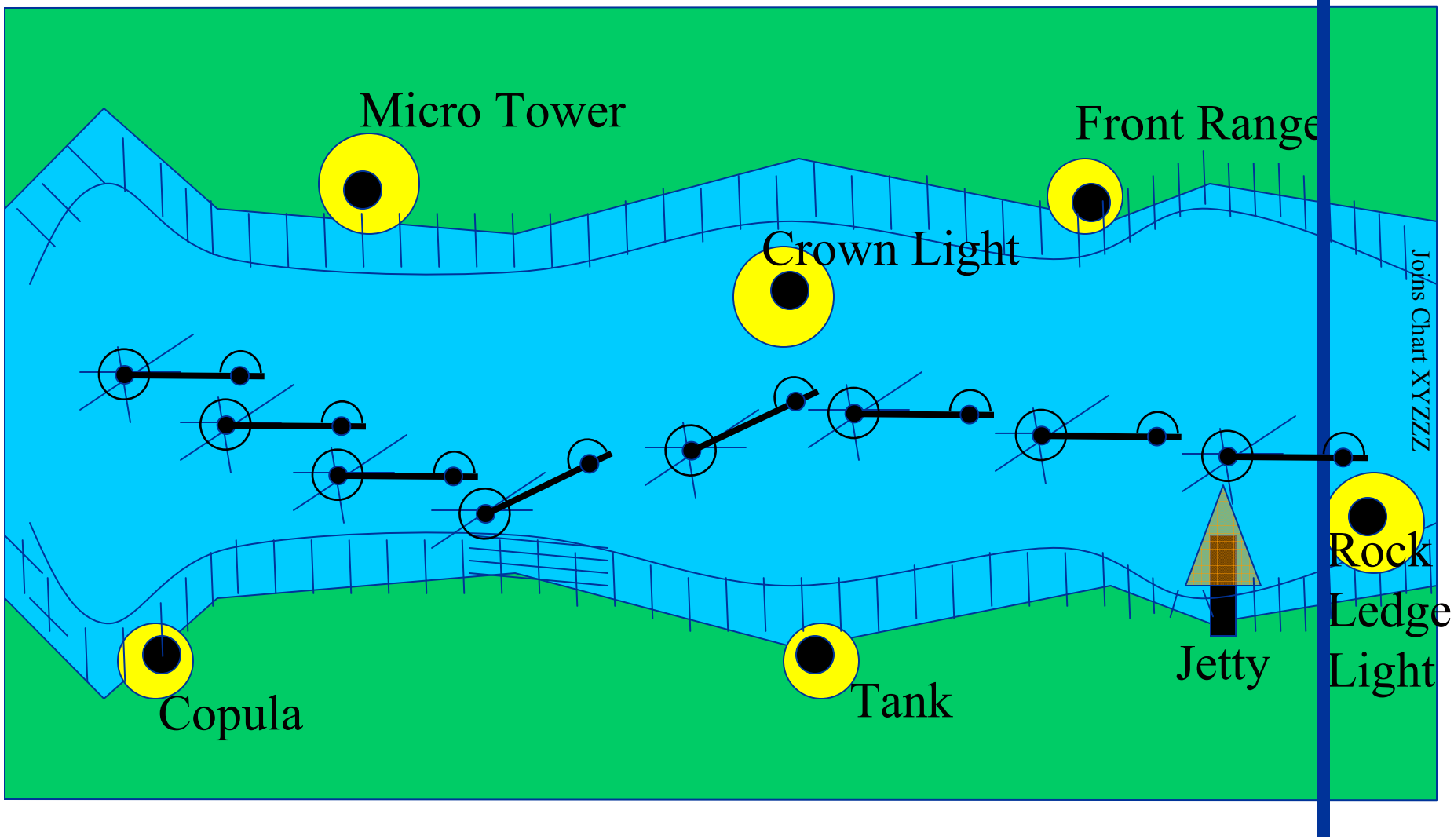
Course Overview…

- ✓ The Chart
  - Primary emphasis on chart preparation
- ✓ The Fix
  - Visual & Electronic
  - Accuracy and errors
- ✓ The DR
  - The most important thing on the chart
- Making landfall
  - The Navigation Brief
- Navigation Party
  - Organization, procedures & philosophy
- Navigation Practical

The Fix…

- What interval is required?
  - Hourly?
  - Half hourly?
  - Fifteen minutes?
  - Ten Minutes?
  - Five Minutes?
- It depends
  - However, it should be obvious when looking at the chart when it changes – and why
- The Skipper determines Fix Interval!

The Chart Shift



Making Landfall…

The Chart Shift

- Many navigation mistakes occur at the chart shift point
- Skipper should approve Chart Shift – as follows:

"Officer in Charge, my DR holds us leaving this chart in 30 minutes. Recommend shifting to chart 12224"

"Very well. Shift to Chart 12224."

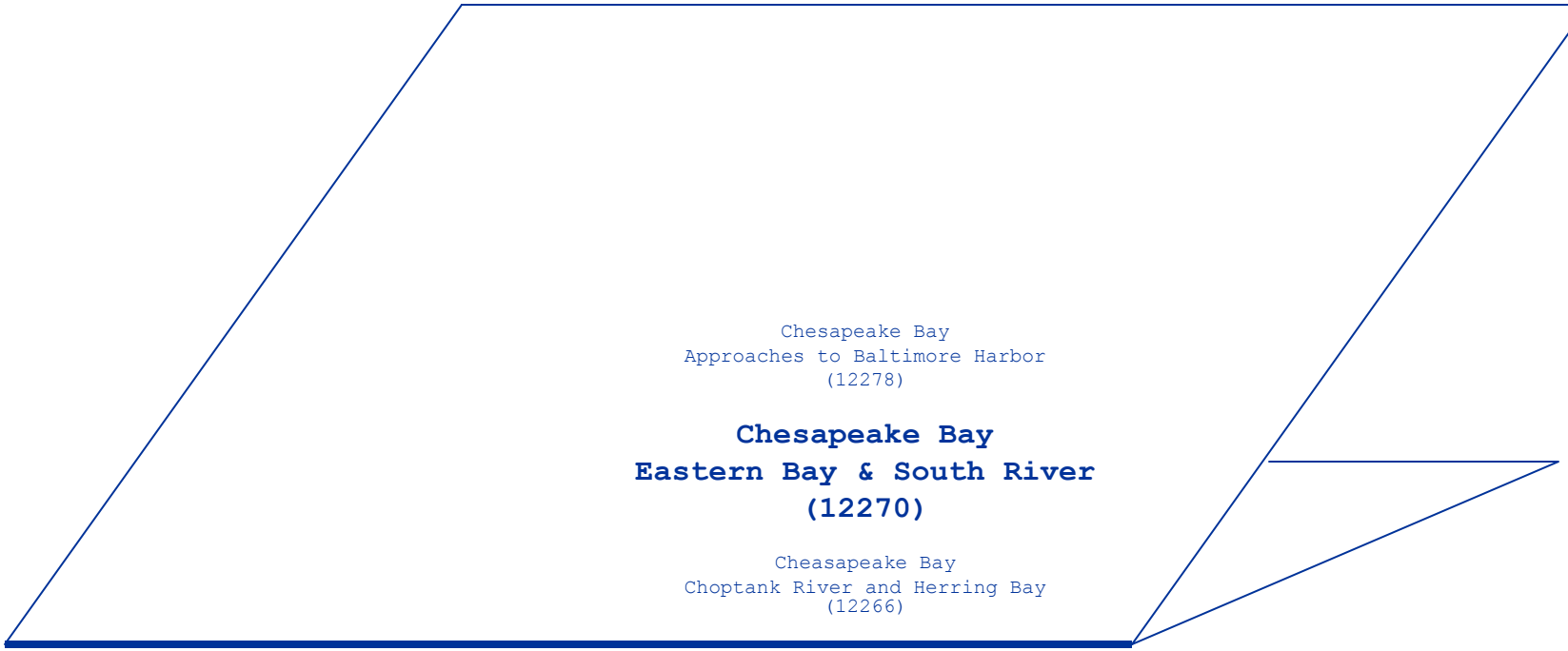
"Shift to Chart 12224, Aye."

How Do You Do The Shift???

What should you look for personally to make sure this is done correctly?

- The **back** of the current chart – Make sure the number matches what you calculated when warm, dry and rested!!!
- The chart is **ready** for use
  - The Chart Prep Checklist
- Remember this???

How Do You Fold A Chart?



How's It Labeled?

Chesapeake Bay
Approaches To Baltimore Harbor
(12278)

Chesapeake Bay
Eastern Bay & South River
(12270)

Chesapeake Bay
Choptank River & Herring Bay
(12266)

The Chart Prep Checklist…

Navy Sailing Chart Preparation Checklist

Chart Number _____

1. Note the chart's sounding datum (X the appropriate box).

Fathoms ____ Feet ____ Meters ____

2. Box the Sounding Datum. Highlight in orange and verify that it's visible after the chart is

_____ X _____ = _____ ____

(i.e., For a CSNTS Cruise: 8 feet times 2 = 16 ft)

7. Review the chart for actual sounding datum line. Choose one based on line 6 above, rounding up if required (typical depth contour lines are at 12 or 18 feet): ____

8. Mark this sounding line with a dark blue marker. Pay particular attention to the rate of change of depth, and mark the chart accordingly.

9. Visual Navigation Aids: Carefully review the chart, and identify visual navaids:

- Circle, highlight in yellow, and label with an easily spoken, unmistakable short noun name ABC. (Thomas Point Light)

10. Navigation hazards: Carefully review the chart, and identify unlighted buoys and other nav hazards.

- Circle, highlight in pink, and label UNLIT (ABC) or NAVHAZ (ABC) or HAZ (ABC).

11. Radar Aids: Carefully review the chart, and identify radar nav aids (points of land, lighthouses, RACON buoys, etc.).

- Triangle, highlight in orange, and label ABC
- Pay particular attention for RACON buoys. These should have a circle and a triangle, and be labeled RACON ABC

raft channel to alert the
lic.

sh the shoal water areas in dark
d thus rapidly changing

he chart in large legible letters.
he north/southbound track

15. Verify Currency: Immediately prior to use, verify the chart has been corrected and is up to date by querying the NIMA Notice To Mariners Database at:

http://pollux.nss.nima.mil/untm/untm_j_options.html?class_flag=N

Latest Chart Edition _____ On-hand Chart Edition _____

Latest Notice To Mariners ____

CHART UPDATED THROUGH NOTICE TO MARINERS _____/_____
Number Date

Submitted: _____ Reviewed: _____
Midshipman Navigator AOIC/Navigator

Approved: _____
Officer In Charge

Did you, in fact, sign off on this chart???

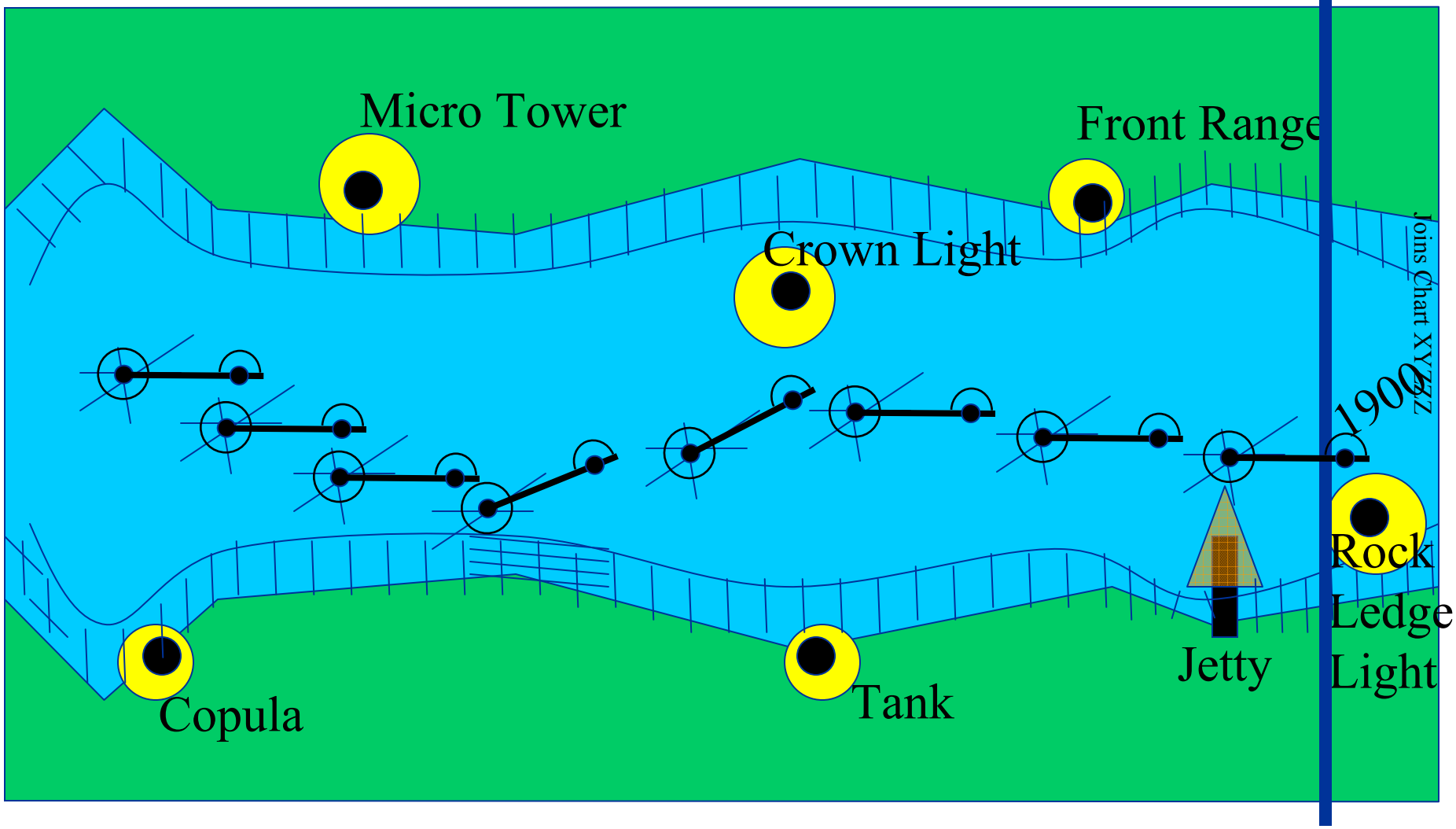
If not – reverse course and do it right!!!

How Do You Do The Shift???

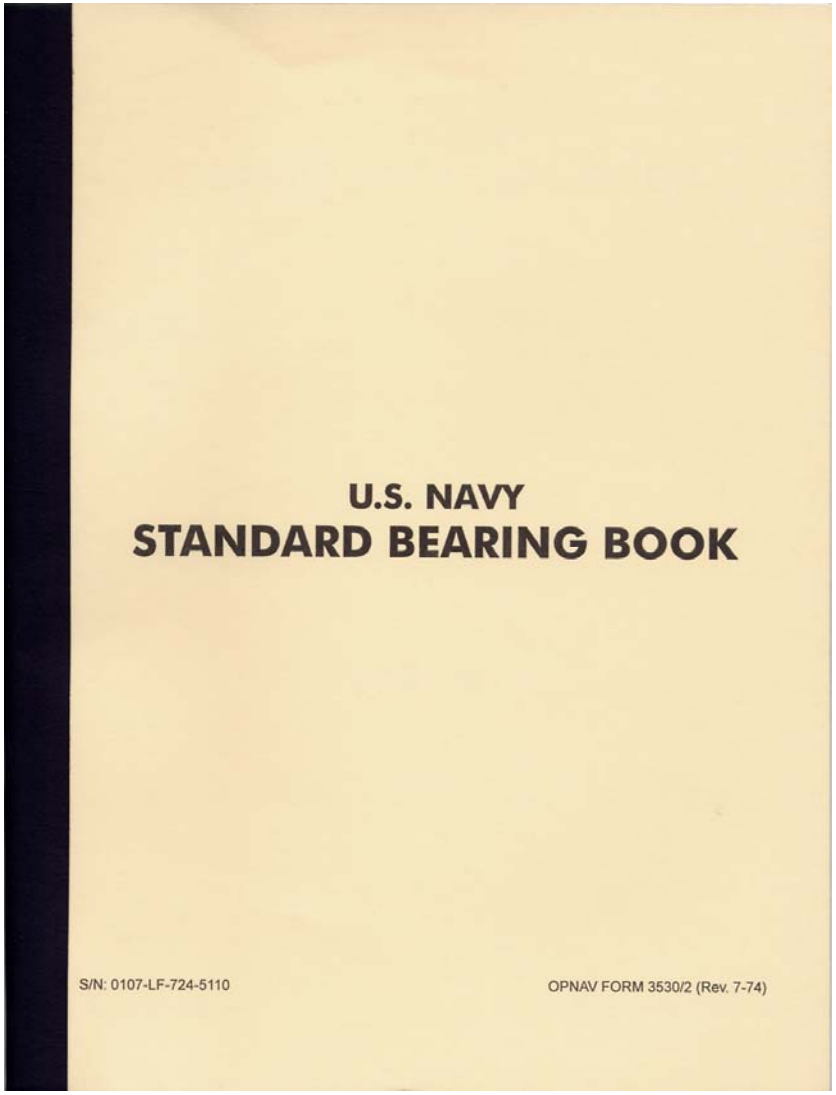
What should the plotter do?

- Determine the Latitude and Longitude of the DR that will be advanced onto the new chart
- Write it in the log
- “Shifted to chart 12224. Advanced DR position 34°17.8’N 074°16.4’W
- Check you didn’t make a transcription error
- Plot this DR position on the new chart
- See the homework problem

The Chart Shift



The Bearing Record Book…



STANDARD BEARING BOOK
OPNAV FORM 3530/2 (7-74)

RECORD GYRO BEARINGS

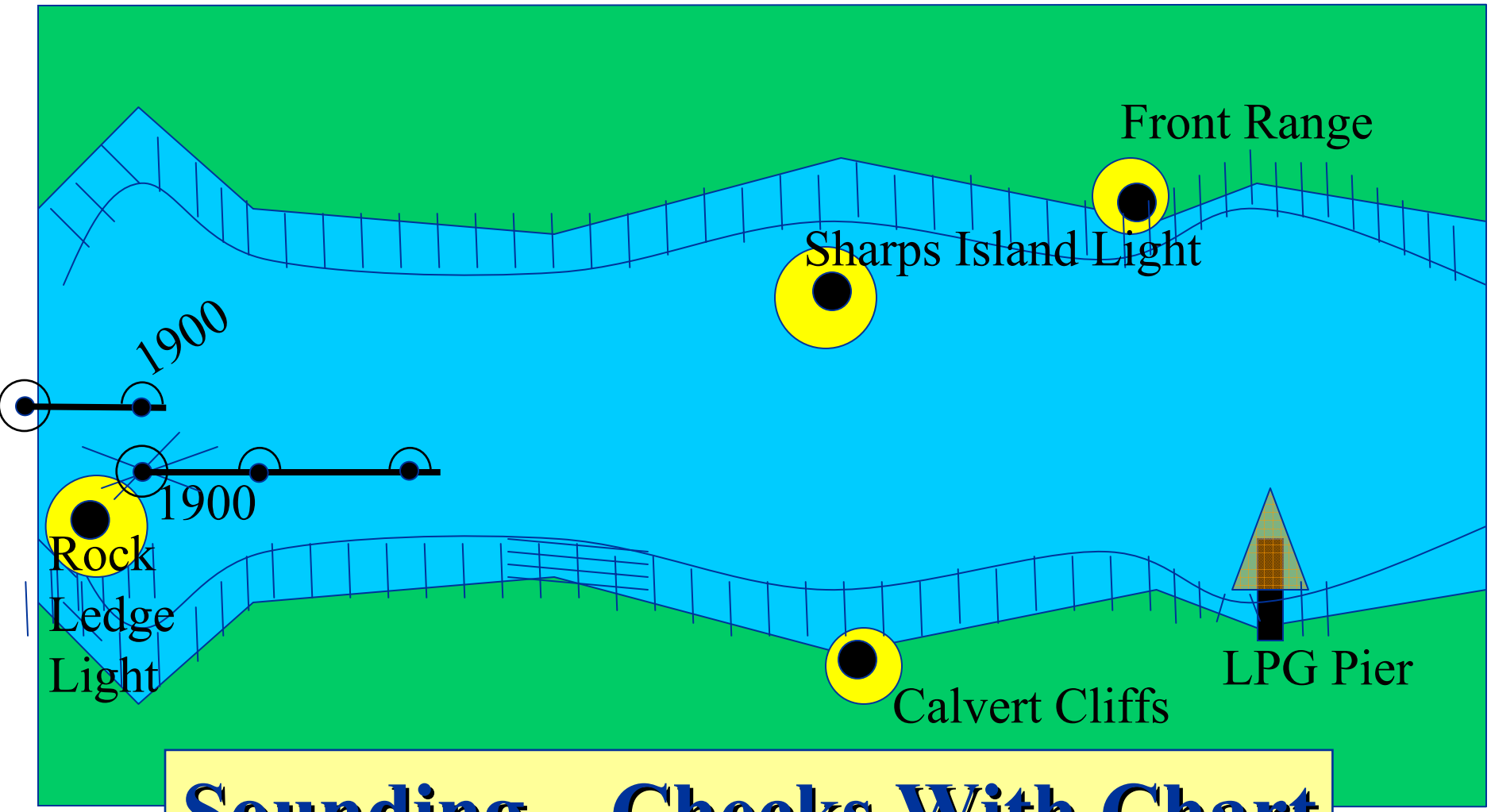
All Bearings °In Magnetic

PLACE _____ GYRO ERROR _____

DATE TIME	Micro Tower	Crown Light	Cupola			DEPTH
1730	360	045	215	Tank		35ft
1740				127		30 ft
1750	355	040	220	132		25 ft
1800	346	025		165		12 ft
1810	. . .					
1820	. . .					
1830	. . .					
1840	. . .					
1850	. . .					

Shifted to chart 12224. Advanced DR position:
34°17.8'N 074°16.4'W

The Chart Shift



Sounding – Checks With Chart

How Do You Do The Shift???

What should the plotter do?

- Fix the vessel's position at OR BEFORE the time of the advanced DR
- Compare and contrast those two posits
- Sounding???
- Does this make sense?
- DR
  - Minimum cyclic routine: Plot Label DR
  - Six rules of DR
    - Don't plot a fix on the new chart without something to compare it to

How Do You Do The Shift???

What should the plotter do?

- Invite Watch Captain and Skipper/ASkipper to check the shift.

"Officer in charge. Shifted to Chart 12224. Fixed the ship's position at time 1240 by Loran C, checks with DR. Request you lay below to check the chart."

- Check it – and not in a perfunctory manner

How Do You Do The Shift???

Check it – and not in a perfunctory manner

- What do I mean by that?
  - Check the log entry – It's your logbook!!!
  - Compare what's written to the displayed data
  - Break out the dividers and plot it - yourself
  - Or, shoot a round – yourself
  - Then initial the log book

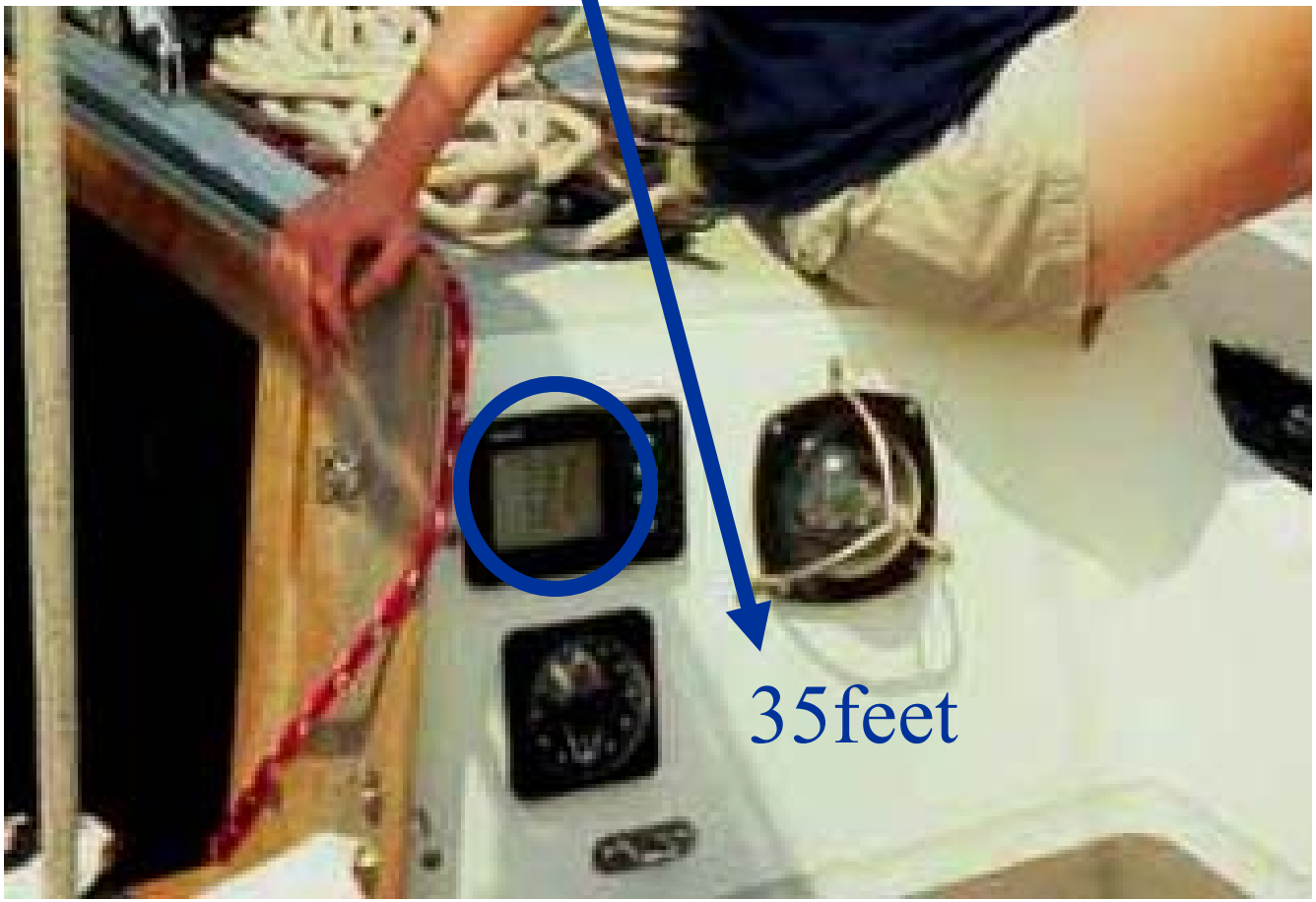
Caution!!!

When you make the chart shift UPDATE YOUR INSTRUMENTATION to match the chart exactly:

- Open Ocean Charts are often in Degrees, Minutes and Tenths
- Piloting Charts are often in Degrees, Minutes and Seconds
- Sounding datum – fathoms, feet or meters???
- Tell everyone the new “No go sounding”
- Make sure they acknowledge

The Fatho…

Write the NEW “No Go Sounding” In Grease Pencil Here

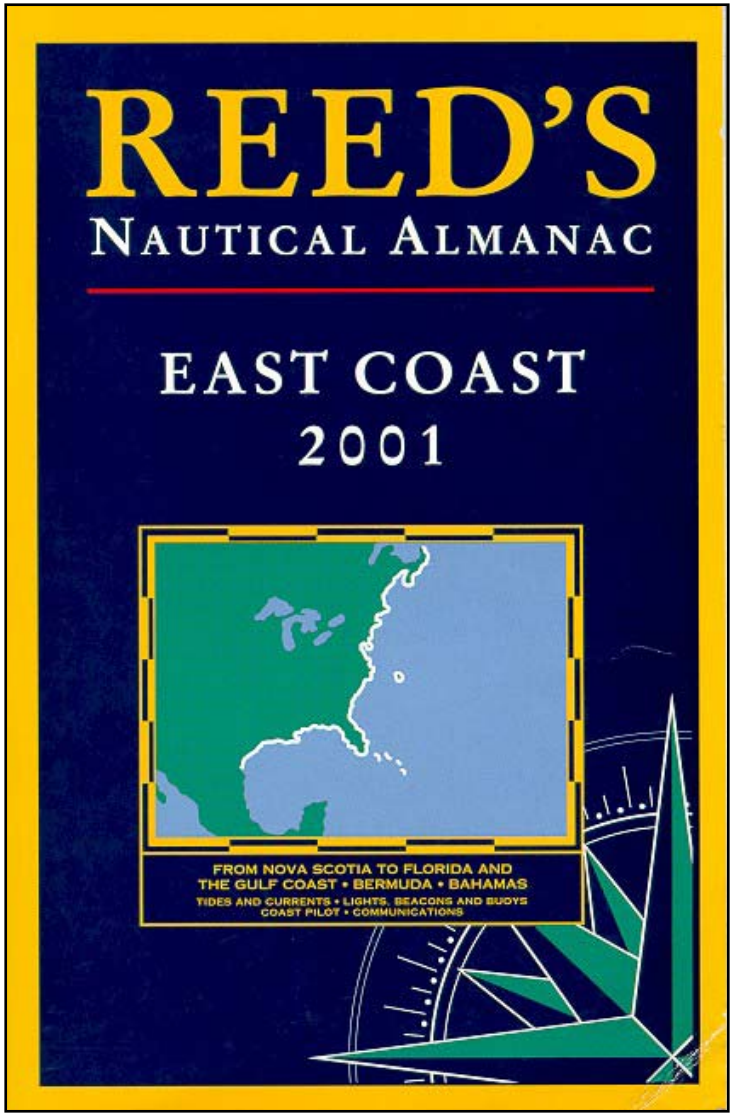


The Nav Brief

Break out & use the Navigation Brief Checklist

- This checklist was derived from those used in the fleet, but was modified for use in the Navy Sailing Program
- Who is responsible for the busy work?
- What do you read to make sure you know what you need to know?

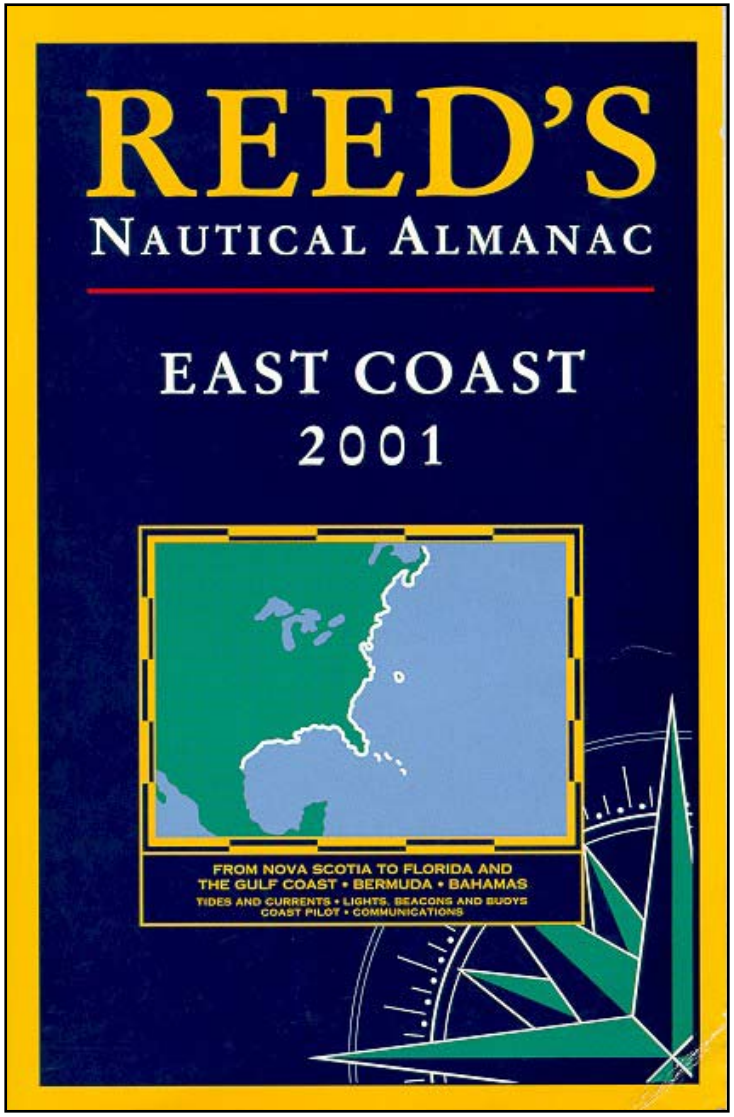
What Pub should you use?



Truly one stop shopping

- Chapter 1 – The Coast Pilot
- Chapter 2 – Tides
- Chapter 3 – Currents
- Chapter 4 - Resources

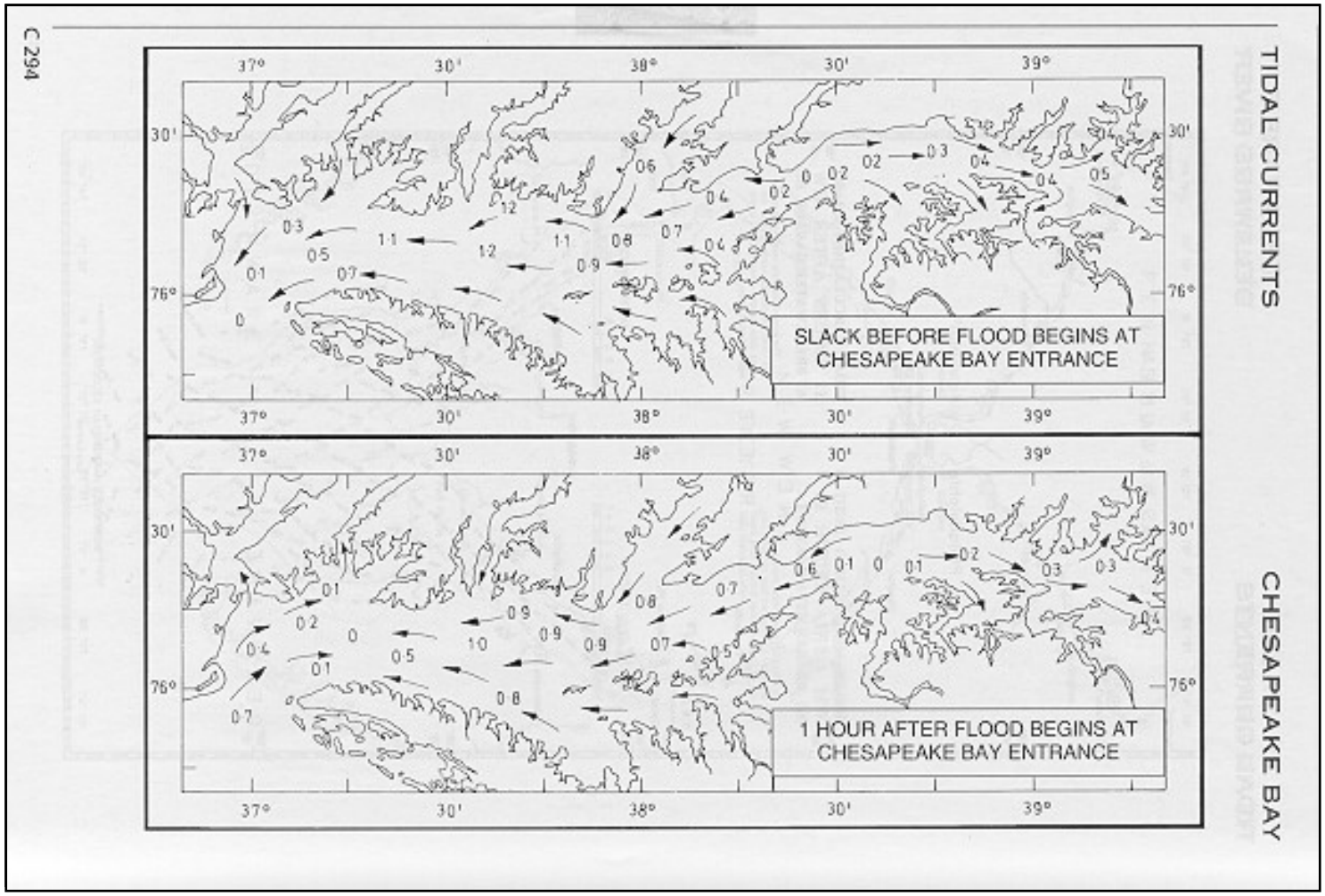
What Pub should you use?



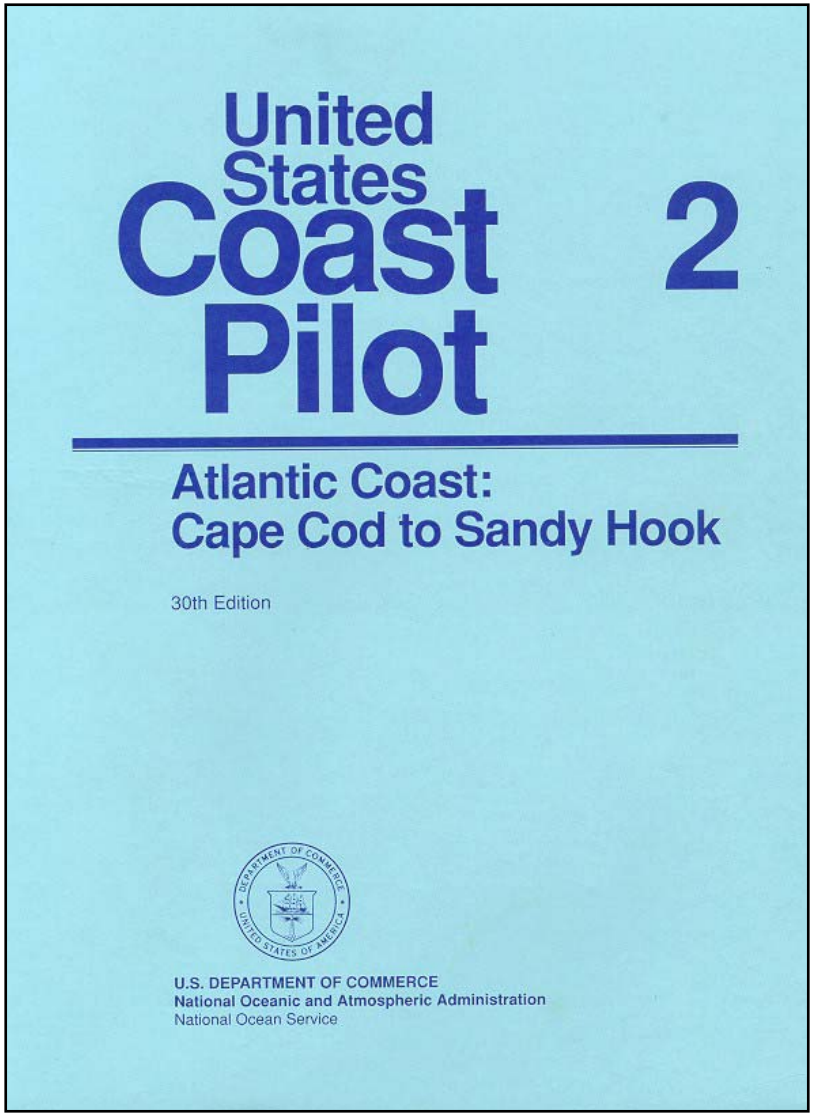
Tides & Currents

- We haven't talked about it in this course, but Reed's presents the material in an easily understood format

Reed's Tides & Currents

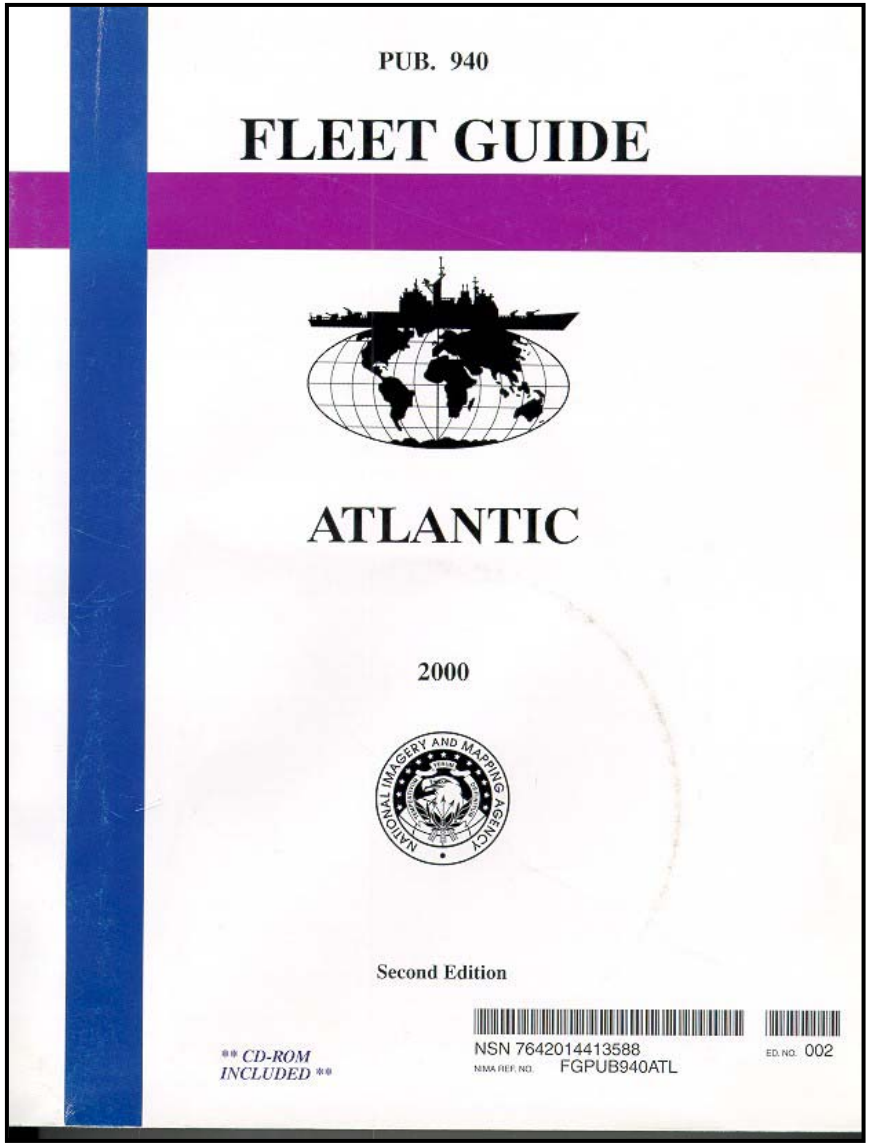


What Pub should you use?



It's essentially Reed's Chapter 1

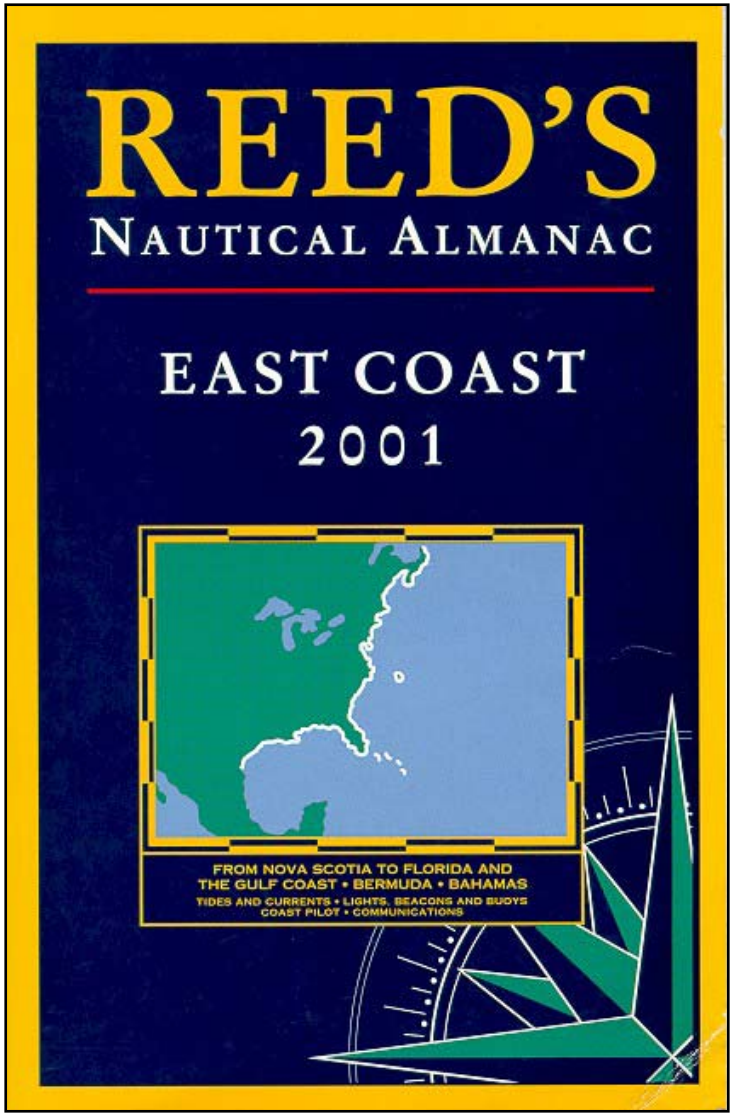
What Pub should you use?



Read this to ensure you don't do something stupid in a Navy controlled port like:

- Newport
- New London
- Boston

Again – This one Pub covers every day of the passage



Truly one stop shopping

- Chapter 1 – The Coast Pilot
- Chapter 2 – Tides
- Chapter 3 – Currents
- Chapter 4 - Resources

The Nav Brief
When, Where, Why & How

- When?
  - Early. Typically late afternoon on th day prior to arrival
- Where?
  - In the cockpit
  - Caution: The only time you should allow the chart topside
- Why?
  - There's always one stupid question
- How?

Too Late…

Review The Forecast…

How???

- Wake everyone up
- Review the Watch Quarter & Station Bill
  - SOP, Appendix
- USE THE CHECKLIST

What Do The Skipper/XO Need To Know?

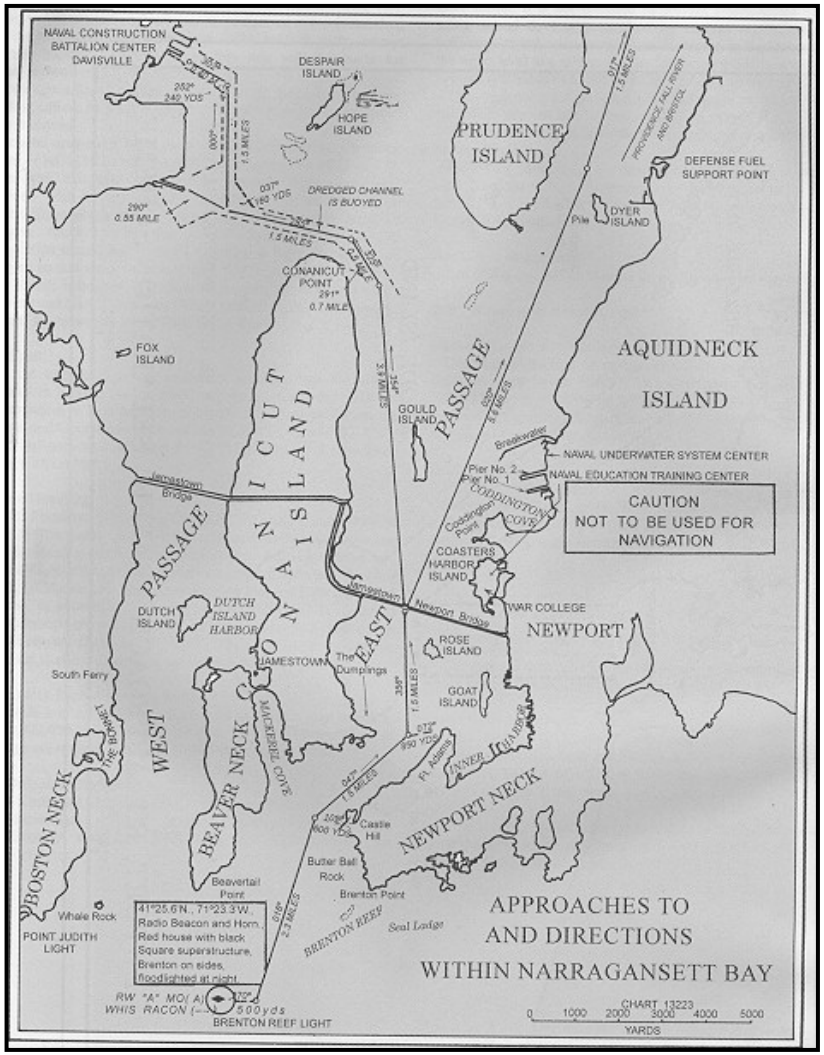
You should be able to sketch the key elements of the chart from memory

- Pay particular attention to expected nav aids, nav hazards and courses to steer (memorize the dots)

If you're mentally challenged, and after several days off shore you may be…

- Make a gouge
  - You can copy (and better laminate) sections of the chart, pages from Reed's and/or the Fleet Guide
- Write notes to yourself on the reverse

For example…

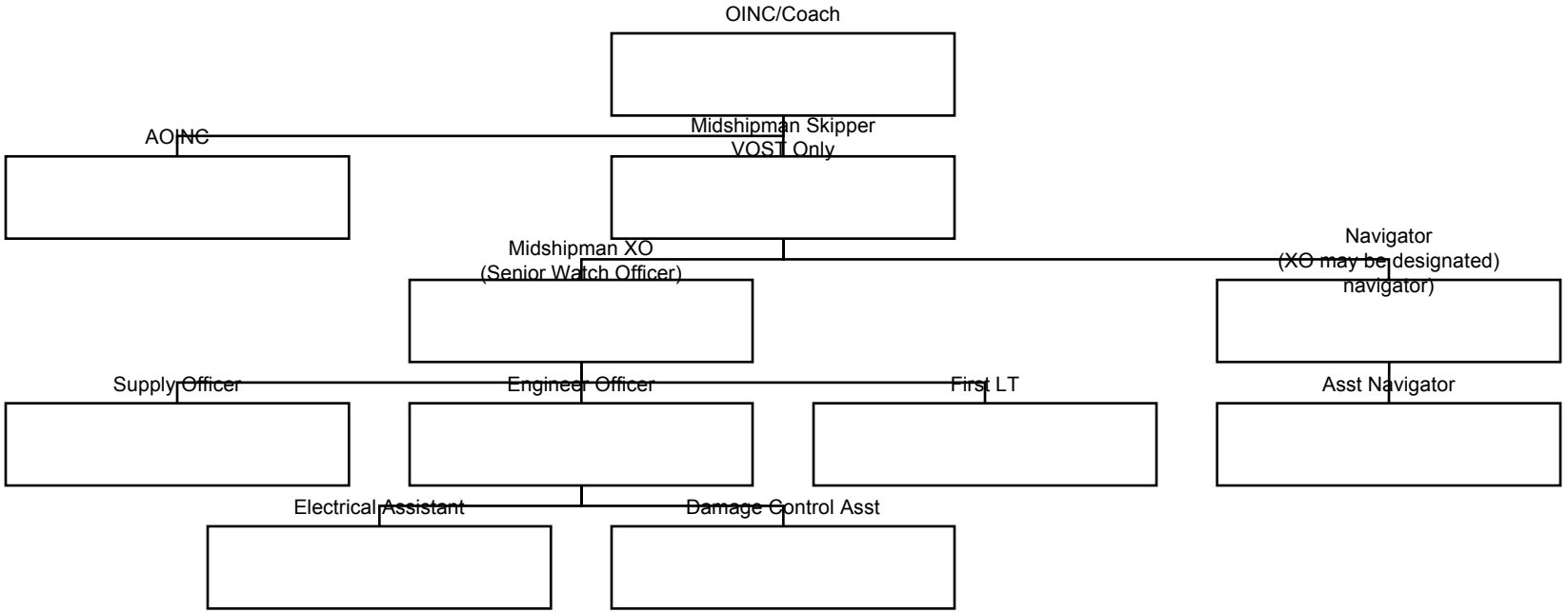

NAVAL CONSTRUCTION BATTALION CENTER DAVISVILLE
DESPAIR ISLAND
HOPE ISLAND
PRUDENCE ISLAND
DEFENSE FUEL SUPPORT POINT
DREDGED CHANNEL IS BUOYED
DYER ISLAND
CONANICUT POINT
FOX ISLAND
CONANICUT ISLAND
GOULD ISLAND
AQUIDNECK ISLAND
NAVAL UNDERWATER SYSTEM CENTER
NAVAL EDUCATION TRAINING CENTER
Pier No. 2
Pier No. 1
CODDINGTON COVE
CAUTION NOT TO BE USED FOR NAVIGATION
COASTERS HARBOR ISLAND
WAR COLLEGE
NEWPORT
Jamestown Bridge
Newport Bridge
DUTCH ISLAND
DUTCH ISLAND HARBOR
JAMESTOWN
The Dumplings
EAST PASSAGE
WEST PASSAGE
ROSE ISLAND
GOAT ISLAND
South Ferry
MACKEREL COVE
BEAVER NECK
BOSTON NECK
INNER HARBOR
Ft. Adams
NEWPORT NECK
Castle Hill
Butter Ball Rock
Beavertail Point
Brenton Point
Whale Rock
POINT JUDITH LIGHT
BRENTON REEF
Seal Ledge
41°25.6'N., 71°23.3'W.
Radio Beacon and Horn.
Red house with black
Square superstructure.
Brenton on sides,
floodlighted at night.
RW "A" MO(A)
WHIS RACON (
500 yds
BRENTON REEF LIGHT
APPROACHES TO AND DIRECTIONS WITHIN NARRAGANSETT BAY
CHART 13223
0 1000 2000 3000 4000 5000
YARDS

The Navigation Party

The Crew…

- Skipper
- XO
- Watch Section 1 – 4 Third Class Midshipmen
- Watch Section 2 – 4 Third Class Midshipmen

The Crew…


OINC/Coach
AOINC
Midshipman Skipper
VOST Only
Midshipman XO
(Senior Watch Officer)
Navigator
(XO may be designated)
navigator)
Supply Officer
Engineer Officer
First LT
Asst Navigator
Electrical Assistant
Damage Control Asst

The Skipper/XO…

The safe and proper navigation of Sail Training Craft (STC) is, at all times, the responsibility of the assigned Skipper.

The Skipper shall delegate navigational authority to the embarked midshipmen whenever possible in order to enhance their training; however, ultimate responsibility will

reside permanently with the Skipper

The Skipper/XO…

The Skipper is responsible directly to DNAS for compliance with directives contained in the applicable OPORDER and will serve as Safety Officer during underway watchstanding

The Skipper/XO…

The XO is responsible directly to the Skipper for compliance with applicable directives, and together with the Skipper will fulfill the role of Safety Officer
during underway watchstanding

XO

- Assigned as Navigator
- See SOP, Page 2-7

<u>As Navigator…</u>

• Report to the Skipper

• Ensure all required charts, navigation instruments and references are prepared and aboard prior to getting underway

• Create a Navigation Plan prior to getting underway and measure progress underway with respect to the plan

XO

<u>As Navigator…</u>

- Ensure the watch teams maintain an accurate plot of the boat's position by all available means (visual, celestial and electronic)
- Train and supervise watch team navigators in the principles of visual, celestial and electronic navigation
- Train the Midshipmen Navigator & ANAV

Youngsters

- Midshipman Navigator & Assistant Navigator
- Assign your best third class midshipmen to these roles
- Assign your XO to be his shadow!!!

The Watch Section

On Deck…

- Skipper or XO (act as Watch Captains)
- Helm
- Navigation Plotter
- Lookout
- Crew

Note:
The Watch Captain cannot serve as Navigation Plotter
Or
Lookout!!!

The Watch Captain…

<u>Overarching concepts…</u>

- The key supervisory position in the conduct of the watch.
- Has overall responsibility for the safe operation of the STC, the efficient performance of the watch and the progress of the daily routine.

- Relieves LAST!!!

The Watch Captain…

Duties and Responsibilities…

- Remain attentive to external conditions at all times; anticipate and respond to changes early (Navigation hazards nearby)
- Train the watch team
- Supervise the watch team navigator

And much, much more…

The Navigation Plotter…

Overarching concepts…

- The Navigation Plotter shall be a distinct station in the watch rotation. The Watch Captain may assign the Navigation Plotter for the duration of the watch, or may rotate the position among watch team members (not to include the Watch Captain).

The Skipper must ensure the crew understands the rotation policy prior to getting underway.

The Navigation Plotter…

<u>Overarching concepts…</u>

• In no case shall an STC go for more than one hour without fixing its position.

• In piloting waters, the Navigation Plotter shall plot a fix at an interval that does not exceed half the time it would take the STC to reach the nearest navigational hazard at current speed.

The Navigation Plotter…

Duties and Responsibilities…

- The Navigation Plotter Serves as the Watch Team Navigator
- Fix the position of the STC in accordance with the fix interval established by the Skipper.
- Maintain the navigation plot adhering to the six rules of DR.
- DR two fix intervals ahead to ensure the boat is not standing into danger
- Make course-to-steer recommendations to the helmsman

The Navigation Plotter…

Duties and Responsibilities (continued)…

- Monitor HF/VHF radios and advise the Watch Captain of pertinent radio traffic
- Maintain a radar watch (if warranted)
- Maintain The Offshore Yacht Log…

Printed Neatly In BLACK INK

And much, much more…

The Helmsman…

Duties and Responsibilities…

- Maintain a good lookout
- Maintain the ordered course. Inform the Watch Captain and Watch Team Navigator if unable to maintain the ordered course.
- Monitor sail trim

And much, much more…

The Lookout…

Duties and Responsibilities…

- Reports to the Watch Captain
- Maintain a proper lookout – See COLREGS
- Report all contacts to the Helmsman

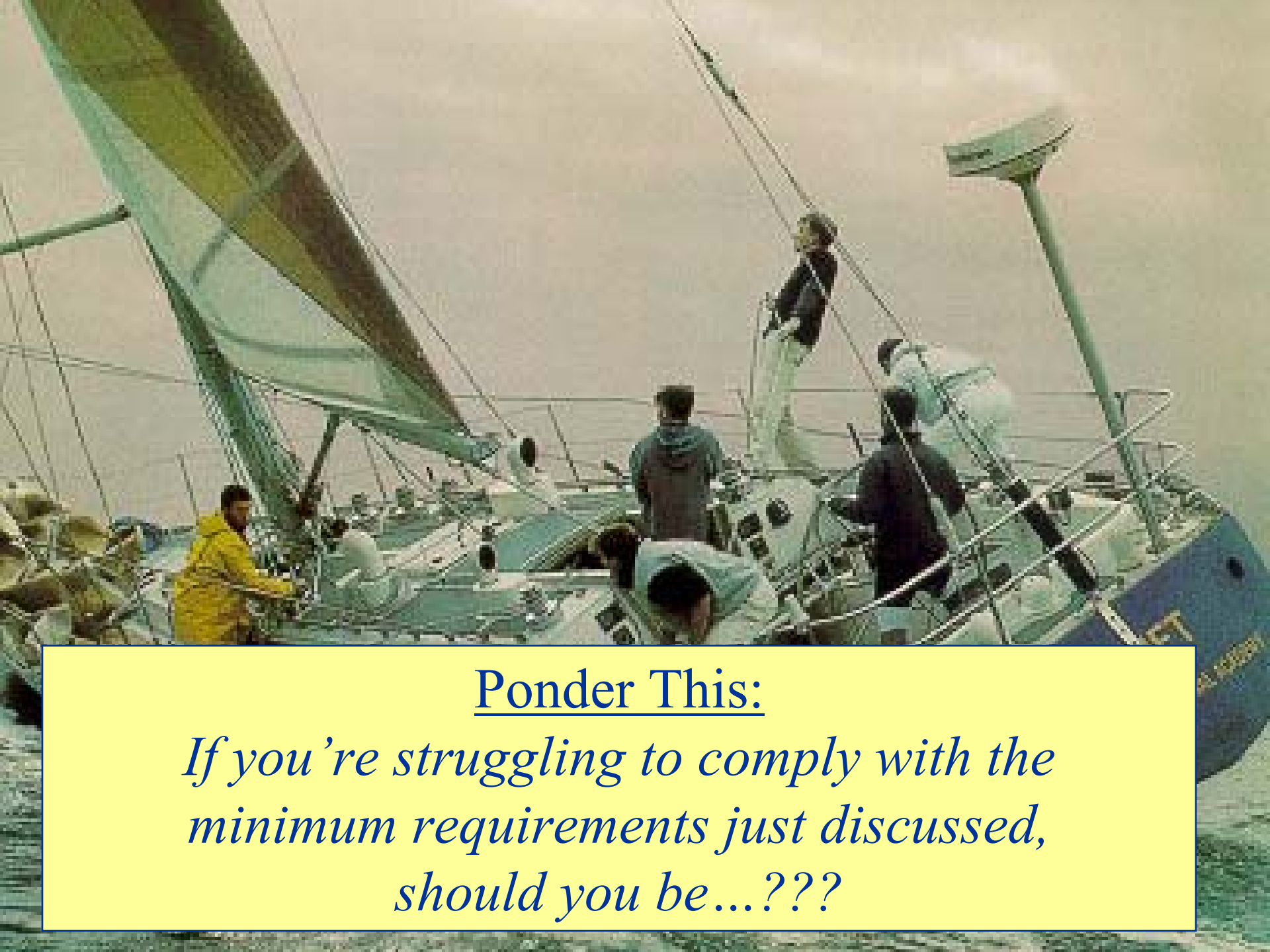
And…

Not Much More!!!

Watch Relief…

Watch relief…

- Prior to relieving the watch the oncoming watchstanders shall:
  - Review the navigation plot with emphasis on current position, expected navigation aids and hazards and desired course.
  - Determine the following once topside:
    - Identity and location of all visible and expected nav aids/hazards



Ponder This:

If you're struggling to comply with the minimum requirements just discussed, should you be…???

How you get in trouble…

The Six Rules Of Deduced Reckoning

1. Every hour on the hour
2. At the time of every course change
3. At the time of every speed change
4. At the time of obtaining a single line of position
5. At the time of obtaining a fix or running fix
6. A new course line shall be drawn from each fix or running fix as soon as it is determined

YOU MUST KNOW THESE!!!

You Must Know How To Apply These!!!

Uncertainty…

- Any time you aren't sure where you are – what do you do??
  - One average guy calls for the chart to be brought topside
  - **No, No, No…**
  - Another average guy goes below to look at the chart
  - **No, No, No…**
  - Turn around and go back down your track
  - Figure it out, then turn back around

A Few More No No Nos…

Buoy Hopping

• Fully crewed yacht whose mission it is to teach Navigation

Play "Follow the leader"

• Never turnover navigational responsibility to an external agent

• Don't misunderstand – This doesn't mean ignore local knowledge

Drive at night without your headlights on

• DR always, always ahead of the boat

A Few More No No Nos…

Go Faster Than Your Team Can Support

- Fully crewed yacht
- How well are they trained???

However…

Your job is to push them…

But make sure you have a safety net!!!

Practical Exam…
Most frequently noted errors

- The Chart Shift - Advancing the DR
- The three Line Of Position Fix
  - The LOPs are construction lines…
- The DR
  - Bold and obvious
- Six Rules of DR
  - Know and apply
  - The single line of position
- Latitude and Longitude
  - Determining latitude and longitude
  - Logging it: 38° 14’ 46” N 076 ° 38’ 14” W

People…

- Key to success, And **Failure**

Homework

- Read the SOP, Chapter 2
- Read the SOP, Appendices A & B
- Read, study and think about the Incident Report
- Prepare for the Nav Practical